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| EXAMINER | |
|---|---|
| ZHENG, EVA Y | |
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| 2611 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/011,026 | SHPERLING ET AL. | |
| | Examiner | Art Unit | |
| | Eva Yi Zheng | 2611 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *16 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-17,19-41* is/are rejected.

7)☒ Claim(s) *4,5,18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 1-41 have been considered but are moot in view of the new ground(s) of rejection.

### *Drawings*

2. The marked-up drawings were received on 10/16/06. Examiner is not considering these drawings since they contain new subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

### *Claim Rejections - 35 USC § 112*

4. Claims 35-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding to claim 35, limitation: "the second output being a difference of the first and second signals" was not described in the original specification.

### *Claim Rejections - 35 USC § 101*

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23-34 are rejected under 35 U.S.C. 101 because they are direct to computer program listing.

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 2, 6, 8-13, 16, 17, 19-24, 26, 30-34, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kotzin et al (US 6,038,263) in view of Wang et al. (US. 2002/0003774).

a) Regarding to claim 1, Kotzin et al disclose in a wireless communication system, the communication system providing communication services to a plurality of mobile

stations, a method for providing a plurality of transmit diversity protocols (it is inherent that Kotzin et al's transmit diversity system would provide communication with multiple mobile stations), the method comprising:

generating a first signal ($W_X$ in Fig. 4);

generating a second signal ($W_Y$ in Fig. 4);

phase-shift modulating the first signal to produce a phase-shift modulated signal (QPSK, Col 5, L 41-46; 310, 312 and 314 in Fig. 4);

transmitting the phase-shift modulated signal via a first antenna (218 in Fig. 4); and

transmitting the second signal via a second antenna (222 in Fig. 4),

wherein the first pilot is based on a first orthogonal code and the second pilot is based on a second orthogonal code (abstract; Col 9, L 21-27).

Kotzin et al disclose all the subject matters above except for the specific teaching of the details of generation the first and second signals based on the first and second data streams, and the first signal and second signal are diverse relative.

However, Wang et al. disclose a transmit diversity system wherein pilots are transmitted by a first antenna (5 in Fig. 1), while orthogonal pilots are transmitted by a second antenna (6 in Fig. 1). The first signal is generated based on the pilot symbol 20 (Fig. 3A) of a first data stream and the pilot symbol 23 of a second data steam. The second signal is generated based on the pilot symbol 42 (Fig. 4A) of a first data stream and the pilot symbol 46 of a second data steam. It is clear that pilot symbol 46 is

inverted version of pilot symbol 23. Therefore, the first and second signals are diverse relative ([0029 and 0031]).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of diverse relative pilot signals of Wang et al in the transmit diversity system of Kotzin et al. By doing so, perform simple and effective channel estimation, better transmission quality, and further eliminate interferences and multipath effect in a transmit diversity system.

b) Regarding to claim 12, Kotzin et al disclose in a wireless communication system, the communication system providing communication services to a plurality of mobile stations, a base station for providing a plurality of transmit diversity protocol (it is inherent that Kotzin et al's transmit diversity system would provide communication with multiple mobile stations), the base station comprising:

a first signal generator (generate Wx in Fig. 4);

a second signal generator (generate $W_y$ in Fig. 4);

a phase-shift modulator coupled to the first signal generator, the phase-shift modulator being operable to modulate the first signal to produce a phase-shift modulated signal (QPSK, Col 5, L 41-46; 310, 312 and 314 in Fig. 4);

a first antenna coupled to the phase-shift modulator, the first antenna being operable to transmit the phase-shift modulated signal (218 in Fig. 4); and

a second antenna coupled to the second signal generator, the second antenna being operable to transmit the second signal (222 in Fig.4).

Kotzin et al disclose all the subject matters above except for the specific teaching of the details of generation the first and second signals based on the first and second data streams, and the first signal and second signal are diverse relative.

However, Wang et al. disclose a transmit diversity system wherein pilots are transmitted by a first antenna (5 in Fig. 1), while orthogonal pilots are transmitted by a second antenna (6 in Fig. 1). The first signal is generated based on the pilot symbol 20 (Fig. 3A) of a first data stream and the pilot symbol 23 of a second data steam. The second signal is generated based on the pilot symbol 42 (Fig. 4A) of a first data stream and the pilot symbol 46 of a second data steam. It is clear that pilot symbol 46 is inverted version of pilot symbol 23. Therefore, the first and second signals are diverse relative ([0029 and 0031]).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of diverse relative pilot signals of Wang et al in the transmit diversity system of Kotzin et al. By doing so, perform simple and effective channel estimation, better transmission quality, and further eliminate interferences and multipath effect in a transmit diversity system.

c) Regarding to claim 23, Kotzin et al disclose in a wireless communication system, the communication system providing communication services to a plurality of mobile stations, wherein a processor operates in accordance with a computer program embodied on a computer readable medium for providing a plurality of transmit diversity protocol (it is inherent that Kotzin et al's transmit diversity system would provide communication with multiple mobile stations), the computer program comprising:

a first pilot signal ($W_X$ in Fig. 4);

a second pilot signal ($W_Y$ in Fig. 4);

a third routine that directs the processor to phase-shift modulate the first signal to produce a phase-shift modulated signal (QPSK, Col 5, L 41-46; 310, 312 and 314 in Fig. 4);

a fourth routine that direct the processor to transmit the phase-shift modulated signal via a first antenna (218 in Fig. 4); and

a fifth routine that directs the processor to transmit the second signal via second antenna (222 in Fig.4).

wherein the first pilot is based on a first orthogonal code and the second pilot is based on a second orthogonal code (abstract; Col 9, L 21-27).

Kotzin et al disclose all the subject matters above except for the specific teaching of the details of generation the first and second signals based on the first and second data streams, and the first signal and second signal are diverse relative.

However, Wang et al. disclose a transmit diversity system wherein pilots are transmitted by a first antenna (5 in Fig. 1), while orthogonal pilots are transmitted by a

second antenna (6 in Fig. 1). The first signal is generated based on the pilot symbol 20 (Fig. 3A) of a first data stream and the pilot symbol 23 of a second data steam. The second signal is generated based on the pilot symbol 42 (Fig. 4A) of a first data stream and the pilot symbol 46 of a second data steam. It is clear that pilot symbol 46 is inverted version of pilot symbol 23. Therefore, the first and second signals are diverse relative ([0029 and 0031]).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of diverse relative pilot signals of Wang et al in the transmit diversity system of Kotzin et al. By doing so, perform simple and effective channel estimation, better transmission quality, and further eliminate interferences and multipath effect in a transmit diversity system.

d) Regarding to claims 2, 13 and 24, Wang et al disclose wherein the step of generating the first signal based on the first data stream having the first pilot and the second data stream having the second pilot comprises combining the first data stream and the second data stream such that the first signal includes the first pilot and the second pilot, and wherein each of the first and second pilots is based on a Walsh code (inherent as orthogonal code; Fig. 3A; [0029 and 0031]).

e) Regarding to claims 6 and 26, Wang et al disclose wherein the step of generating the second signal based on the first data stream having the first pilot and the second data stream having the second pilot comprises combining the first and second data streams such that the second signal includes the first pilot and the second pilot, and

wherein each of the first and second pilots is based on a Walsh code (inherent as orthogonal code; Fig. 4A; [0029 and 0031]).

f) Regarding to claims 8 and 30, Kotzin et al disclose wherein the phase-shift modulated signal comprises a first phase-shift modulated signal (310, 312 and 314 in Fig. 4; Col 5, L 41-46), and further comprising the step of phase-shifting the second signal (413, 411 and 415 in Fig. 4; Col 8, L 7-10) to produce a second phase-shift modulated signal.

g) Regarding to claims 9 and 31, Kotzin et al disclose wherein the step of transmitting a second signal via a second antenna (222 in Fig. 4) comprises transmitting the second phase-shift modulated signal via a second antenna (413, 411 and 415 in Fig. 4; Col 8, L 7-10).

h) Regarding to claims 10, 21 and 32, Kotzin et al disclose wherein the communication system operates in accordance with one of a CDMA 200-1X communication protocol and an IS-95 communication protocol (Col 3, L59-67).

i) Regarding to claims 11, 22 and 33, Kotzin et al disclose wherein the plurality of transmit diversity protocols comprises one of an orthogonal transmit diversity (OTD) protocol, a space time spreading transmit diversity (STS-TD) protocol, and a phase-shift transmit diversity (PSTD) protocol (Col 1, L1-10).

j) Regarding to claim 16, Wang et al disclose wherein the first signal generator comprises a first signal combination circuit (inherent as block 2 of Fig. 1), wherein the first signal combination circuit is operable to combine the first data stream and the second data stream to produce the first signal (pilot symbols 20,23,26 Fig. 3A).

k) Regarding to claim 17, Wang et al disclose wherein the second signal generator comprises a second signal combination circuit (inherent as block 3 in Fig. 1), wherein the second signal combination circuit is operable to combine the first data stream and the second data stream, to produce the second signal, and wherein the second signal is diverse relative to the first signal (pilot symbols 42,46,50 Fig. 4A).

l) Regarding to claim 19, Kotzin et al disclose wherein the phase-shift modulator (310, 312 and 314 in Fig. 4; Col 5, L 41-46), comprises a first phase-shift modulator operable to modulate the first signal to produce a first phase shift modulated signal, and further comprising a second phase-shift modulator (413, 411 and 415 in Fig. 4; Col 8, L 7-10) operatively coupled to the second signal generator, wherein the second phase-shift modulator is operable to modulate the second signal to produce a second phase-shift modulated signal.

m) Regarding to claim 20, Kotzin et al disclose wherein the second antenna (222 in Fig. 4) comprises an antenna operatively coupled to the second phase-shift modulator, and wherein the antenna is operable to transmit the second phase-shift modulated signal (413, 411 and 415 in Fig. 4; Col 8, L 7-10).

n) Regarding to claim 34, Kotzin et al disclose wherein the medium is one of paper, a programmable gate array, application specific integrated circuit, erasable programmable read only memory, read only memory, random access memory, magnet media, and optical media (Col 4, L10-18).

o) Regarding to claim 41, Wang et al disclose wherein generating the first signal based on the first data stream having the first pilot and the second data stream having

the second pilot comprises combining the first data stream and the second data stream such that the first signal includes the first pilot and an inverted version of the second pilot, the second signal comprising the second pilot (Fig. 3A; [0029 and 0031]).

p) Regarding to claims 3, 7, 14, 15, 25, and 27, Kotzin et al and Wang et al. disclose all the subject matters above except for the specific teaching of Walsh code W0 and W16. However, such limitation is merely matter of design choice. The current application and system of Kotzin et al and Wang et al are all direct to transmit diversity design. They all focus on implementing orthogonal code to migrate interference. Whether the Walsh code is W0, W16 or some others does not effect the system output as a whole, therefore, it would have been obvious to one of ordinary skill in art to implement the Walsh code W0 and W16 in the transmit diversity system of Kotzin et al and Wang et al.

### *Allowable Subject Matter*

8. Claims 4, 5, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Zheng whose telephone number is 571-272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eva Yi Zheng
Examiner
Art Unit 2611

December 18, 2006

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER